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WITNESS my hand this
Seventh day of October 2004

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AUSTRALIA

Patents Act 1990

PROVISIONAL SPECIFICATION

Invention Title:

A Device for Joining Panels

The invention is described in the following statement:

Field of the Invention

The present invention relates to a device for forming a joint between two panels and particularly relates to a one-piece device that is used to bridge a gap between panels.

Background Art

In the building industry, various joiners are used to bridge gaps between adjacent panels of sheeting such as fibre-cement sheeting.

Conventional joiners include "H-frames" which generally comprise an elongate strip that, in cross-section, form an "H". In use, one piece of sheeting is inserted into one side of the "H' and bolted in place. It is then necessary to manoeuvre the second piece of sheeting such that it is inserted into the other side of the "H". This is a cumbersome and difficult procedure, particularly when joining sheeting in elevated areas such as eaves.

The present invention aims to overcome the problems of the prior art and provide a joining device that is simple to use and yet provides a smooth join between adjacent panels of sheeting.

Any discussion of documents, acts, materials, devices, articles or the like which has been included in the present specification is solely for the purpose of providing a context for the present invention. It is not to be taken as an admission that any or all of these matters form part of the prior art base or were common general knowledge in the field relevant to the present invention as it existed before the priority date of each claim of this application.

Summary of the Invention

Throughout this specification the word "comprise", or variations such as "comprises" or "comprising", will be understood to imply the inclusion of a stated element, integer or step, or group of elements, integers or steps, but not the exclusion of any other element, integer or step, or group of elements, integers or steps.

In a first aspect, the present invention consists in an elongate joining member for bridging a gap between a first and at least a second panel, each panel having a first surface and an opposed second surface, the joining member comprising a flange member, an extension member extending from said flange member and at least one retaining member connected to said extension member, said at least one retaining member being moveable relative to the extension member between a first configuration and a second configuration and wherein, in use, when in its second configuration, said at least one retaining member is insertable through said gap between the first and at least second panels, and wherein when inserted through said gap, said at least one retaining member is engageable with at least a portion of the second surface of each panel and said flange member is engageable with at least a portion of the first surface of each panel such that said flange member substantially bridges the gap between said at least first and second panels.

In a second aspect, the present invention consists in a panel assembly comprising at least two panels, each having a first surface, a second opposed surface and side walls, said at least two panels arranged relative to one another such that a sidewall of one panel and a sidewall of a second panel define a gap therebetween, said gap bridged by an elongate joining member comprising a flange member, an extension member extending from said flange member and at least one retaining member connected to said extension member, said at least one retaining member being moveable relative to the extension member between a first configuration and a second configuration to allow insertion of said retaining member through said gap and wherein said at least one retaining member engages at least a portion of the second surface of each panel and said flange member engages at least a portion of the first surface of each panel such that said flange member substantially bridges the gap between said at least first and second panels.

In a third aspect, the present invention consists in a method of bridging a gap between at least two panels, each panel having a first surface and a second opposed surface, the method including the steps of:

(a) providing an elongate joining member comprising a flange member, an extension member extending from said flange member and at least one retaining member connected to said extension member;

(b) aligning said joining member with the gap between said at least two panels; and

(c) applying pressure to the joining member to cause the at least one retaining member to move from a first configuration to a second configuration such that said retaining member is moveable through said gap and at least partly beyond said gap whereupon the at least one retaining member moves from said second configuration to said first configuration and engages at least a portion of the second surface of each panel and wherein further, the flange member is brought into engagement with at least a portion of the first surface of each panel.

In the above third aspect, pressure may be initially applied to the joining member by a user. In this respect, once aligned with the gap, a user may provide an initial force to move the retaining member to its second configuration i.e. a user may use their hand or, alternatively a mallet or other such force to initially force the retaining member into the gap whereupon, the sidewalls exert a force to maintain the retaining member in said second configuration.

The joining member is typically a one-piece unit.

Typically, the joining member of the above aspects bridges a gap between two adjacent modular panels.

The flange member typically comprises a main body defined on one side by a first surface for engaging said at least a portion of the first surface of both the first and second panels and a second opposing side that presents the outward appearance of the join. The flange member may be movable from a first configuration to a second configuration. For example, the flange member may be made from a resiliently flexible material and may move from a first configuration wherein it comprises a slightly domed structure during installation of the joining member to a substantially flat configuration when the joining member is fully installed between the gap. When in the second substantially flat configuration, the first surface of the flange member may be substantially flush with the two panels such that the flange member provides a smooth join between the first and at least a second panel.

In a further embodiment, the flange member may be substantially L-shaped such that it is adapted to engage adjacent panels that are positioned substantially at right angles to each other to form a corner.

The extension member of aspects one to three preferably extends from a proximal end adjacent the flange member to a distal end and may comprise an elongate rib. The elongate rib may be relatively straight. Alternatively, the elongate rib may include at least one recessed portion along its length. This embodiment may be desirable in situations where a cross beam or other structure extends across the space or gap between the modular panels. An extension member having a recessed portion can fit around such a cross beam.

In one embodiment, the at least one retaining member comprises opposing first and second leg members each connected to and disposed at an angle relative to the extension member. The first and second leg members preferably extend from a first end that is connected to a region of the extension member to a second end that is free from the extension member. Typically, the leg members extend from the first end to the second end in a direction towards the proximal end of the extension member such that, when the joining member is in use, the leg members extend towards the second surfaces of the panels to engage said second surfaces of the panels.

In one embodiment, the leg members may be connected to the distal end or a region adjacent the distal end of the extension member.

Preferably, the length of the extension member between the flange member and the region of connection with the first end of each leg member is greater than the thickness of a modular panel to be joined.

Typically, the first configuration of the leg members relative to the extension member is an expanded configuration, that is, each leg member is angled relative to the extension member such that the leg members and the extension member together form an anchor to anchor the joining member between the panels. The angle of the leg members relative to the extension member may vary but when said leg members are in their expanded configuration, the angle must be such that each leg engages a portion of a respective second surface of the panels and prevents the leg members moving back through the gap. Essentially, when the leg members are in their expanded configuration, the distance between the second end of the first leg and the second end of the second is greater than the width of the gap between the panels.

Preferably, the second configuration is a collapsed configuration with the leg members disposed at an angle relative to the extension member that is less than said angle when the leg members are in their expanded configuration. While the angle between the leg members and the extension member may vary when said leg members are in the collapsed configuration, the angle must be such that the leg members are insertable through the gap between the panels when in said collapsed configuration

Preferably, the first end of the first leg member is connected to substantially the same region of the extension member as the first end of the second leg member. In this regard, the orientation of the leg members relative to the extension member may form a V-shape. Alternatively, the connection between said first ends of the leg members and the extension member may present a more curved U-shaped structure.

In one embodiment, the second end of the first leg member is adapted to engage the second surface of the first panel and the second end of the second leg member is adapted to engage the second surface of the second panel. Such engagement between the leg members and the panels anchors the joining member in place between the panels.

In a further embodiment, the second end of each leg member may include a foot member that is disposed at an angle to the leg member. The foot members may include a grooved or serrated face or any other means to allow the foot members to grip the second surfaces of the panels and to thereby further secure the joining device between the panels.

Typically, the entire joining member and preferably at least the leg members are made from a resiliently flexible material. In this regard, when the leg members are inserted through the space or gap between the panels, the force exerted on the leg members from the sidewalls of the adjacent panels defining the gap, causes each leg member to move from its expanded configuration to its collapsed configuration. In the second collapsed configuration, the leg members together with a substantial length of the extension member may be fed through the gap to a hollow at the rear of the panels. Once beyond the panels and with the release of the compressive force exerted by the sidewalls of said panels, the leg members are free to take on their expanded configuration. In this regard, the joining members are preferably manufactured such that the leg members are biased relative to the extension member i.e. the leg members

are biased in a resting state. Accordingly, upon release of the compressive force exerted by the sidewalls of the panels, the leg members take on their biased resting state.

In a further embodiment, the retaining member may include a single leg member connected to the extension member. As above, it is preferred that the leg member is made from a suitably resiliently flexible material such that when the leg member is inserted through the space or gap between the panels, the force exerted on the leg members from a sidewall of an adjacent panel deforms the leg member such that at least a substantial length of the leg member extends beyond the gap between the panels. However, in this embodiment, it is envisaged that a portion of the leg member adjacent the second end of said leg member may be positioned within the gap between the panels when the joining member is fully installed. In this embodiment, it is preferred that the leg member includes an engagement member along the length of said leg member, said engagement member engaging a second surface of one of the panels. To provide a secure fit within the gap, it is also preferred that the extension member of this embodiment also includes an engagement member to engage a second surface of an adjacent panel. The engagement member of the leg member and the extension member may comprise a ridge or flange or other such structure.

In a fourth aspect, the present invention consists in an elongate joining member for bridging a gap between a first and at least a second panel, each panel having a first surface and an opposed second surface, the joining member comprising a flange member and at least two extension members extending from said flange member each extension member being moveable relative to each other between a first configuration and a second configuration and wherein, in use, when in their second configuration, said at least two extension members are insertable through said gap between the first and at least second panels, at least one of said extension members further including at least one retaining member such that when the at least two extension members are inserted through said gap, said at least one retaining member is engageable with at least a portion of the second surface of a panel and said flange member is engageable with at least a portion of the first surface of each panel such that said flange member substantially bridges the gap between said at least first and second panels.

Preferably, the elongate joining member has two extension members and each extension member preferably includes at least one retaining member.

The two extension members preferably comprise two resiliently flexible legs. The retaining members of this aspect typically comprise a foot connected to a distal end of the legs and at an angle to said legs, each foot having a face to engage a portion of the second surface of adjacent panels and to thereby hold the joining device in place within the gap. Each foot may or may not be resiliently flexible.

During installation, the joining member of this aspect is pushed into the gap such that the two resiliently flexible legs are forced by adjacent sidewalls of the panels to move from the first configuration wherein the said legs are relatively spaced to said second configuration wherein said legs are relatively closer together. Movement to the second configuration allows the resiliently flexible legs and each foot of this aspect to be moved through the gap, that is, both legs and associated feet are of a suitable dimension when the legs are in the second configuration to pass through the gap.

In this aspect, each leg may be straight or alternatively may be angled. Each foot is preferably disposed at an angle of approximately 90° relative to the legs and typically extend a substantial length away from each leg.

In a fifth aspect, the present invention consists in a panel assembly comprising at least two panels, each having a first surface, a second opposed surface and sidewalls, said at least two panels arranged relative to one another such that a sidewall of one panel and a sidewall of a second panel define a gap therebetween, said gap bridged by an elongate joining member, the joining member comprising a flange member and at least two extension members extending from said flange member each extension member being moveable relative to each other between a first configuration and a second configuration and wherein, in use, when in their second configuration, said at least two extension members are insertable through said gap between the first and at least second panels, at least one of said extension members further including at least one retaining member such that when the at least two extension members are inserted through said gap, said at least one retaining member is engageable with at least a portion of the second surface of a panel and said flange member is engageable with at least a portion of the first surface of each panel such that said flange member substantially bridges the gap between said at least first and second panels.

In a sixth aspect, the present invention consists in a method of bridging a gap between at least two panels, each panel having a first surface and a second opposed surface, the method including the steps of:

(a) providing an elongate joining member comprising a flange member and at least two extension members extending from said flange member, at least one extension member including at least one retaining member;

(b) aligning said joining member with the gap between said at least two panels; and

(c) applying pressure to the joining member to cause the at least two extension members to move relative to each other from a first configuration to a second configuration such that said at least two extension members are caused to move into and through said gap and wherein at least a portion of the at least one retaining member is brought into engagement with at least a portion of the second surface of a panel and wherein further, the flange member is brought into engagement with at least a portion of the first surface of each panel.

The panels of each of the above aspects may include fibre cement sheeting or lining including eaves sheeting or lining, patio soffit linings, wall sheeting, weatherboards or decorative fibre cement linings.

The joining member of the present invention typically comprises an elongate strip that may be cut to a desired length by a user. The user may then simply "snap-fit" the joining member into the gaps between adjacent modular panels such that the first leg member engages the rear facing second surface of both modular panels.

The joining member may be sized to be used with varying widths of modular panels.

An advantage of the joining device and method of bridging a gap between at least two modular panels as described above is that the joining device may be applied after the modular panels have been assembled rather than as part of the assembly process of the modular panels as is required by conventional joiners i.e. the present invention allows for retro-fitting of the joining member.

Brief Description of the Drawings

Figure 1a depicts a joining member of one embodiment of the present invention during installation;

Figure 1b depicts the joining member of Figure 1a after installation;

Figure 2a depicts a joining member of another embodiment of the present invention during installation;

Figure 2b depicts the joining member of Figure 2a after installation;

Figure 3a depicts a joining member of a further embodiment of the present invention during installation;

Figure 3b depicts the joining member of Figure 3a after installation;

Figure 4a depicts a joining member of a further aspect of the invention during installation; and

Figure 4b depicts the joining member of Figure 4a after installation.

Detailed Description of the Drawings

The joining member of the present invention is shown generally as 10 in the accompanying drawings. The joining member 10 comprises a flange 11, an extension member 12 extending from the flange 11 and at least one retaining member 13 connected to the extension member 12.

The joining member bridges a gap between a first modular panel 50a and a second modular panel 50b.

The retaining member 13 is moveable relative to the extension member 12 between a first configuration and a second configuration.

When inserted through the gap between modular panels 50a and 50b, the retaining member 13 engages a portion of a second surface 51 of each modular panel 50a and 50b. At the same time, the flange 11 engages a portion of a first surface 52 of each modular panel such that the flange 11 bridges the gap between modular panels 50a and 50b.

The flange 11 is movable from a first configuration to a second configuration. Particularly, the flange 11 is made from a resiliently flexible material that enables it to

move from a slightly domed structure prior to and during insertion of the extension member 12 and the retaining member 13 through the gap (see Figures 1a, 2a, and 3a) to a substantially flat configuration following installation of the joining member as shown in Figures 1b, 2b and 3b. In the second substantially flat configuration, flange member 11 has a flat inner surface 15 that engages the first surfaces 52 of the modular panels 50a and 50b. An outer surface 16 of the flange 11 presents a substantially smooth join between the modular panels 50a and 50b.

The extension member 12 extends from a proximal end 17 adjacent the flange 11 to a distal end 18 and is shown in the drawings as an elongate rib 19. The elongate rib 19 is shown in Figures 1a and 1b as a substantially straight structure. Alternatively, the elongate rib 19 includes a notch 20 as depicted in Figures 2a and 2b.

Figures 1a, 1b, 2a and 2b depict the retaining member 13 comprising opposing first 21 and second 22 leg members each connected to and disposed at an angle relative to the extension member 12. The first leg member 21 and the second leg member 22 extend from a first end 23 that is connected to a region of the extension member 12 to a second end 24 that is free from the extension member 12.

Once the joining member 10 is completely installed, the second end 24 of both leg members 21, 22 engage respective second surfaces 51 of the modular panels 50a and 50b.

In Figures 1a and 1b, the first ends 23 of both the first leg member 21 and the second leg member 22 are connected to the distal end 18 of the extension member. In Figures 2a and 2b, it can be seen that the point of connection between the extension member 12 and the leg members is at a region of the extension member proximal the distal end 18. Alternatively, but not shown, the leg members 21, 22 may be connected at the distal end 18 but the hinging point i.e. the pivot around which each leg member moves may be at a region proximal the distal end 18.

The first configuration of the leg members 21, 22 relative to the extension member 12 is an expanded configuration, that is, the first leg member 21 and the second leg member 22 are angled relative to the extension member 12 such that the leg members 21,22 and the extension member 12 together form an anchor to anchor the joining member 10 between the modular panels. The angle of the leg members 21, 22

relative to the extension member 12 may vary but when said leg members are in their expanded configuration, the angle must be such that each leg member engages a portion of a respective second surface 51 of the modular panels 50a and 50b and prevent the leg members moving back through the gap.

The second configuration is a collapsed configuration with the leg members 21,22 disposed at an angle relative to the extension member 12 that is less than the angle when the leg members are in their expanded configuration. While the angle between the leg members 21,22 and the extension member 12 may vary when said leg members 21,22 are in the collapsed configuration, the angle must be such that the leg members 21,22 are insertable through the gap between modular panels 50a and 50b when in said collapsed configuration

When the leg members 21,22 are inserted through the space or gap between the modular panels 50a and 50b, the force exerted on the leg members 21,22 from sidewalls 53a and 53b of the adjacent modular panels 50a and 50b defining the gap, causes each leg member 21,22 to move from its expanded configuration to its collapsed configuration. In the second collapsed configuration, the leg members 21,22 together with a substantial length of the extension member 12 may be fed through the gap to a hollow at the rear of the modular panels. Once beyond the modular panels and with the release of the compressive force exerted by the sidewalls 53a and 53b of the modular panels, the leg members 21,22 are free to take on their expanded configuration. In this regard, the joining members 10 are manufactured such that the leg members 21,22 are biased relative to the extension member 12 i.e. the leg members are biased in a resting state. Accordingly, upon release of the compressive force exerted by sidewalls 53a and 53b of the modular panels, the leg members take on their biased resting state.

In a further embodiment of the invention as depicted in Figures 3a and 3b, the retaining member 13 includes a single leg member 31 connected to the extension member 12. As above, it is preferred that the leg member 31 is made from a suitably resiliently flexible material such that when the leg member 31 is inserted through the space or gap between the modular panels 50a and 50b, the force exerted on the leg members from sidewall 53a of modular panel 50a deforms the leg member 31 to enable insertion of the leg member 31 and the extension member 12 through the gap at least to a point where a substantial length of the leg member 31 extends beyond the gap between the modular panels. However, in this embodiment, a distal portion 32 of the

leg member 31 adjacent the second end 24 of the leg member sits within the gap between the modular panels. To secure the joining device in place, the leg member 31 includes an engagement member 33 along the length of said leg member, said engagement member engaging the second surface 51 of modular panel 50a. To provide a secure fit within the gap, the extension member 12 of this embodiment also includes an engagement member 33 to engage the second surface 51 of modular panel 50b.

The joining member 10 of the present invention comprises an elongate strip that may be cut to a desired length by a user. The user may then simply "snap-fit" the joining member into the gaps between adjacent modular panels.

The joining member of a further aspect of the invention is generally shown in Figures 4a and 4b as 100. Joining member 100 comprising a flange member 101 and two extension members 102a and 102b. The extension members each include a retaining member 103.

The two extension members 102a and 102b are resiliently flexible and may be forced into a configuration shown in Figure 4a that enables said extension members 102a and 102b to pass through the gap between adjacent panels.

The retaining member 103 comprises a foot 104 connected to each extension members 102a and 102b. As shown in Figure 4b, once each foot 104 passes through the gap, the extension members 102a and 102b may move back to their first spaced configuration such that the feet engage the rear surface of respective panels and the joining member 100 is held in place within the gap.

It will be appreciated by persons skilled in the art that numerous variations and/or modifications may be made to the invention as shown in the specific embodiments without departing from the spirit or scope of the invention as broadly described. The present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive.

Dated this twenty-sixth day of September 2003

Patent Attorneys for the Applicant:
F B RICE & CO

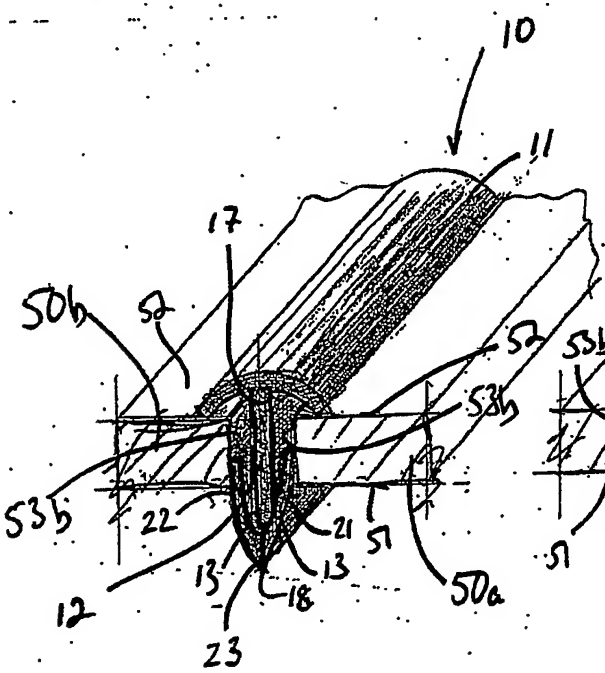

Figure 1a

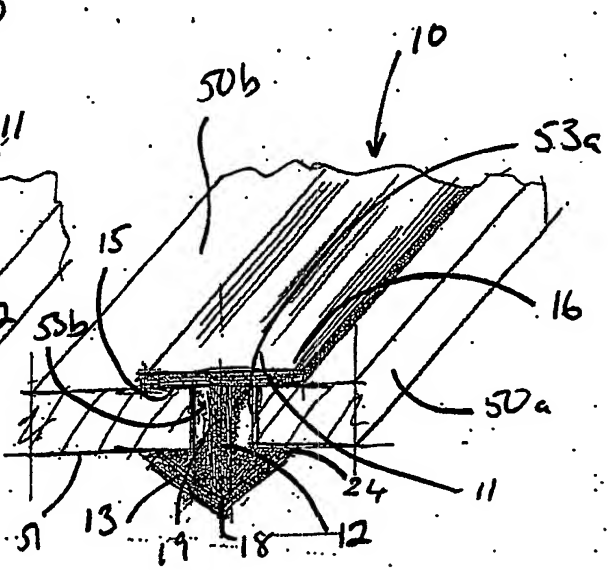

Figure 1b

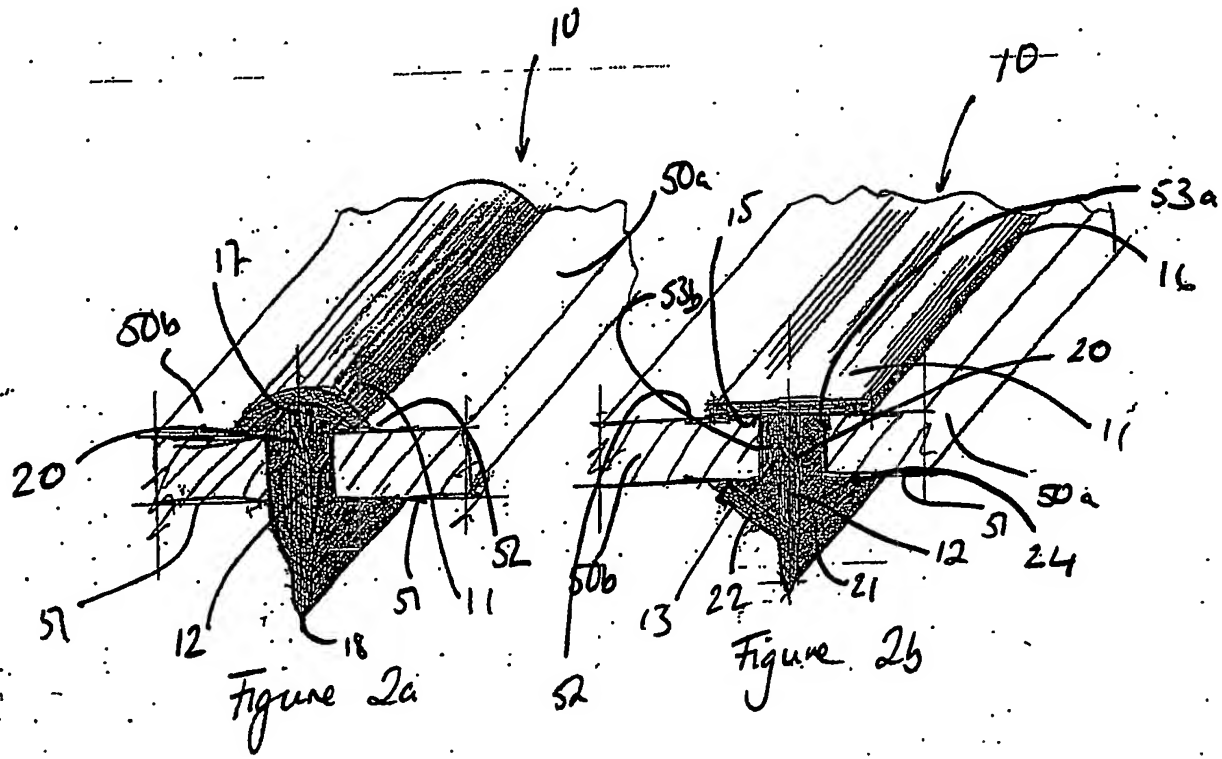

Figure 2a

Figure 2b

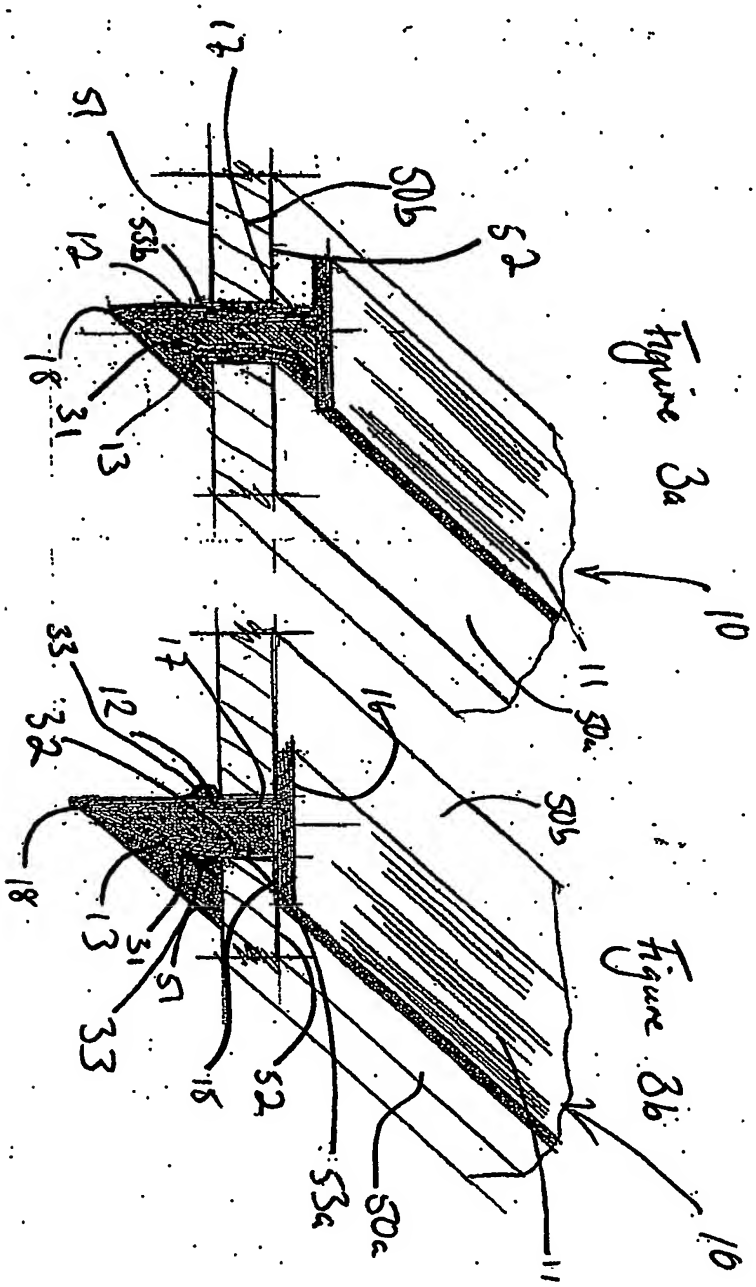

Figure 3a

Figure 3b

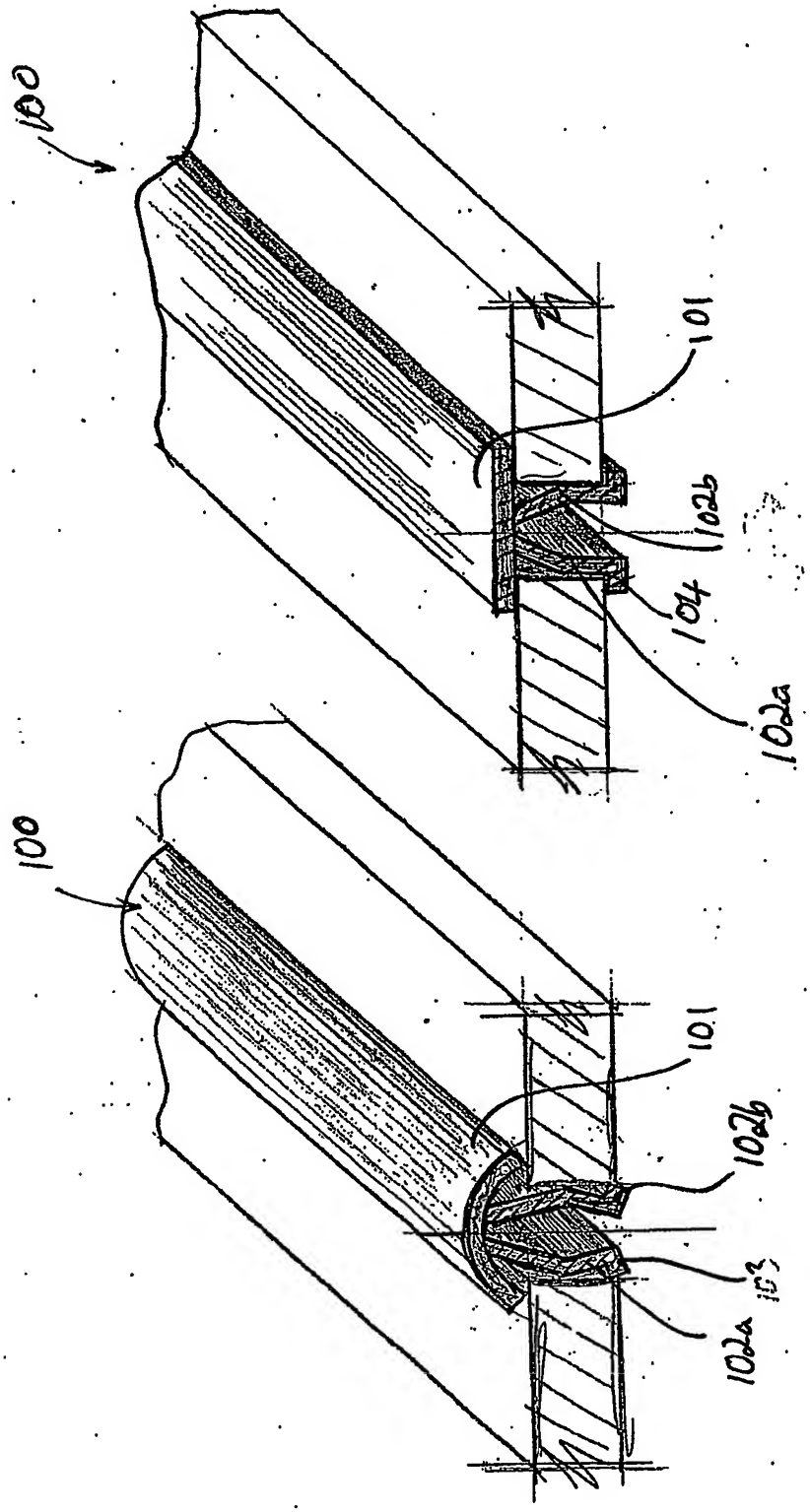

Figure 4b

Figure 4a

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